UYLSSES

Ulysses Urap 144-Sec RAR

90-090B-06C

This dataset has been ingest to CD-ROM Write Once. The data was downloaded from /raid/ftp/spacecraft_data/Ulysses/radio/urap/rar_144sec_ascii data is written in ASCII format. KD & KW numbers along with the time spans are as follows:

KD#	KW#	TIMESPAN
KD022276	KW000180	01/01/91 - 12/30/93
KD022277	KW000181	01/01/94 - 12/30/95
KD022278	KW000182	01/01/96 - 12/30/98
KD022279	KW000183	01/01/99 - 12/31/01
KD022280	KW000184	01/01/02 - 08/16/04

: NCF::POST 6-MAR-2002 06:09:45.06
MAJAMES
POST
update time

From: NCF::JCOOPER "John F. Cooper" 5-MAR-2002 18:46:35.62
To: POST BANDERSON
CC: JCOOPER
Subj: update to 6/2001, Ulysses URAP 144-sec RAR data set

Betty and Ralph:

This is an update of the 144-sec RAR data set from Ulysses. The new data files are of the form uYYMMDD.rav for year 20YY, month MM, and day of month DD in the range YYMMDD = 010101 to 010630. These data files are located on nssdcftp at the following directory:

/raid/ftp/spacecraft_data/ulysses/radio/urap/rar_144sec_ascii/2001/

Please update the # entries including the third paragraph of the brief description.

Thanks.

John

****

taset ID: 90-90B-06C

Name (short): RAR 144sec Avg E Freq Spectra

Type Code: 1

Contact: Hess

Acq. Agent: JFC

NASA HQ Discipline Code: SPHE

NASA HQ Interest Code: 5C

Avail Code: A

First date of data: 1990-10-29

#Last date of data: 2001-06-30

19

#Change of available date: 2002-03-05

Long Name: RAR 144-sec Frequency Spectra for Average Electric Field, Interplanetary

Dfqdat;
ate: 1998-01-06
Form: KV
Quantity: 1

Personnel info;

Dataset Contact:
Type: SO
Title: Dr.
First & middle initial: Robert J.
Last name: MacDowall
Current affl: NASA Goddard Space Flight Center, Code 695
City, State: Greenbelt, MD

Type: CO
Title: Mr.
First & middle initial: Roger A.
Last name: Hess
Current affl: NASA Goddard Space Flight Center, Code 690.2 / Hughes STX
City, State: Greenbelt, MD

Brief Description:

This Ulysses URAP dataset is provided in ASCII format and includes 144-second average data files from the low and high frequency bands of the Radio Astronomy Receiver (RAR). The time period of 144 seconds corresponds to the basic cycling time of the instrument. The 76 frequency channels in this data set give average signal for the electric field corresponding to 64 frequencies at 1.25 to 48.5 kHz in the low band and 12 frequencies at 52 to 940 kHz in the high band. The units of the data are microvolt/Hz^0.5 as measured at the receiver input terminals. To convert to electric field strength the given data must be divided by the effective length of the antenna. This is complicated by the fact that the effective length depends on the frequency-dependent antenna impedance which is affected by the plasma conditions local to the Ulysses spacecraft. The data set includes a user guide document in ASCII text format. Details on the RAR and other URAP sensors are available in Stone, R.G., et al., "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

Data for this data type through June 30, 1999 were previously accessible near-line through the NDADS/SPyCAT service but are currently off-line pending migration to the NSSDC Anonymous FTP site. Later data are already accessible at this latter site, reached either via anonymous ftp login at nssdcftp.gsfc.nasa.gov at directory spacecraft_data/ulysses/radio/urap or via the following Internet URL address:

ftp://nssdcftp.gsfc.nasa.gov/spacecraft_data/ulysses/radio/urap/

Acknowledgements:

"the principal investigator, Dr. Robert J. MacDowall of the NASA Goddard Space Flight Center"

Archive Plan Flag: A
Archiving status flag: C
Archiving Planning/Status:
Arvchiving of these data files will continue through the Ulysses mission.
Archiving Location: NSSDC
Archiving Organization: NASA
Archive Type: P
Documentation Status Flag: D
State of Supporting Documentation:
The URAP users guide further describes the data types and data file formats.
Materials for Distribution:

Hard copies of the URAP users guide and the NDADS Ulysses holdings file.
Bibliographic References:

Sequence Number: 01
TRF ID: B40457-000A

Stone, R.G., J. L. Bougeret, J. Caldwell, P. Canu, Y. DeConchy, N. Cornilleau-Wehrlin, M. D. Desch, J. Fainberg, K. Goetz, M. L. Goldstein, C. C. Harvey, S. Hoang, R. Howard, M. L. Kaiser, P. J. Kellogg, B. Klein, R. Knoll, A. Lecacheux, D. Lengyel-Frey, R. J. MacDowall, R. Manning, C. A. Meetre, A. Meyer, N. Monge, S. Monson, G. Nicol, M. J. Reiner, J. L. Steinberg, E. Torres, C. deVilledary, F. Wouters, and P. Zarka, "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

urap_user_guide

GUIDE TO THE ARCHIVING OF ULYSSES RADIO AND PLASMA WAVE DATA

Roger Hess, Robert MacDowall, Denise Lengyel-Frey

March 15, 1995

1

Contents

□

1 Introduction

The Unified Radio and Plasma wave instrument (URAP) is designed to detect both remotely-generated electromagnetic waves and in-situ plasma waves. The former are radio waves arising from electron beams in the solar wind (type II and type III radio bursts), planetary radio emissions (from Jupiter, the Earth, etc.), and a cosmic background from the local galactic medium. The in-situ waves include thermal plasma fluctuations, electron plasma oscillations (Langmuir waves), ion-acoustic waves, and whistler-mode waves. Wave electric fields from less than 1 Hz to 940 kHz and magnetic fields from less than 1 Hz to 448 Hz can be measured.

An extensive description of the five instruments that make up the URAP investigation can be found in R. G. Stone et. al., Astron. Astrophys. Suppl. Ser., 92, 291-316 (1992). Details relevant to the data archive are contained below. The Astron. Astrophys. Suppl. Ser. issue also contains other articles describing the Ulysses spacecraft as a whole and the other Ulysses instruments.

Ulysses is spun for stability with a period of approximately 12 sec. The Z axis of the spacecraft is defined as being along the spin axis. The X and Y axes are perpendicular to the spin axis.

URAP measures electric field by means of two antennas. One is a dipole formed by two 35 meter long wires along the +/- X axes and the other is a 7.5 meter long monopole that is on the Z axis Because of the longer length of the X antenna compared to the Z antenna, it is much more sensitive and has a much lower background signal level. For these reasons, only the X antenna data are provided in the UDS data files.

Magnetic fields are measured by means of a two axis sensor aligned along the spacecraft Y and Z axes.

2 Delivery Schedule

The URAP team will provide the archival data products to the Ulysses Data System no later than 2 months after GSFC has received the raw data. These data will be provided to the NSSDC no later than 1 year after GSFC has received the raw data.

□

3 Description of the Unified Radio and Plasma Wave Instrument

The Unified Radio and Plasma Wave instrument on Ulysses is divided into several sub-instruments. Data from three of these sub-instruments, the Radio Astronomy Receiver, the Plasma Frequency Receiver, and the Wave Form Analyzer, are represented in the URAP archival data.

3.1 Radio Astronomy Receiver

The Radio Astronomy Receiver is divided into two parts, a low frequency receiver and a high frequency receiver. The low frequency receiver has 64 channels that cover the frequency range from 1.25 to 48.0 kHz in linear steps of 0.75 kHz. The high frequency receiver has 12 channels that cover the range from 52 kHz to 940 kHz in approximately logarithmic steps.

The high frequency receiver is usually operated in what is called "measure" mode, which causes the receiver to step repeatedly through a list of frequencies that is determined by a ROM on board the spacecraft. There are 16 different lists and one of them is chosen by telecommand. The different lists emphasize different frequency ranges, so as to maximize the information received depending on the type of phenomena being studied. Some of the lists include all 12 possible frequency channels while other lists skip some of the frequencies. The list that has been used for most of the mission does include all frequecies, but there may be times when other lists have been used. At these times only a subset of the frequencies will be present.

The low frequency receiver can be operated in measure mode (with its own set of lists of 8 or 16 frequencies) or in "linear sweep" mode where it steps through a contiguous set of frequencies. In linear mode, all 64 frequencies can be stepped through, or a subset of 32 frequencies can be chosen using the lower half, middle half, or upper half of the frequencies. For most of the mission, the low frequency receiver has been operated in linear mode with all 64 frequencies but there have been periods when it has operated in measure mode or in in linear mode with less than 64 frequencies. During these periods only a subset (8, 16, or 32) of the 64 possible frequencies will appear.

Besides the intensity of a signal reaching the spacecraft, the RAR can also, when operated in particular modes, determine additional information about the source of the radiation,

□

including its direction relative to the location of Ulysses, its angular size, and its polarization. This is most efficiently done with the signal from the X and Z axis antennas summed together electronically either with or without a phase shift added between the two signals. Although this additional information cannot be recovered from the averaged data, the mode does have a large effect on the background signal level, so the mode of high and low frequency receivers is given in the data as either summed (X and Z antenna combined) or separate (X antenna alone).

3.2 Plasma Frequency Receiver

The Plasma Frequency Receiver (PFR) is intended to monitor a wide spectrum of plasma phenomena with constant frequency coverage, large dynamic range, and good frequency resolution. Two receivers for Ex and Ez are supplied with a frequency range from 0.57 to 35 kHz that is covered in 32 logarithmic frequency steps. The threshold sensitivity is approximately 2 microvolts per channel.

There are three modes of operation of the PFR. In "fast scan" mode the receivers are swept through all 32 frequencies twice in each telemetry frame (a frame takes 1 second at the highest telemetry bit rate) and 32 such scans are accumulated. The average values of Ex and Ez and the peak signal on Ex are telemetered.

In "slow" scan mode the frequency is stepped only twice per telemetry frame. In each half-frame 32 measurements of the signal at the same frequency are accumulated and the average and peak found and telemetered.

There is also a fixed-frequency mode of operation where the receiver remains on a single frequency.

The instrument is commonly operated in a manner that places it in fast mode for 23 hour, fixed-frequency mode for 1 hour, slow mode for 23 hour, fixed-frequency for 1 hour, and then the cycle repeats.

3.3 Waveform Analyzer

The Waveform Analyzer (WFA) measures electric and magnetic signals in the frequency range from 0.08 to 448 Hz. The WFA divides the spectrum into a low and a high band and the analysis is performed separately for the two bands. The low band consists

of the frequencies 5.33 Hz and below and the high band consists of frequencies 9.3 Hz and above.

The high band processing is performed on Ex, By, and either Bz or Ez depending on a mode command. The information is digitized at a sample rate of 1.792 kHz. Spectra are produced and summed for 2 formats of spacecraft telemetry (64 seconds at the highest telemetry rate). The amplitudes at 12 frequencies are determined using a modified Walsh transform with a bandwidth of 25%. A spectrum is taken for each octant of spacecraft rotation. There are generally 5 or 10 rotations during the 2 format major cycle (depending on the current telemetry bit rate). One set of data obtained, called the averaged data, is the sum of these 5 or 10 spectra per octant, which are then grouped together by opposite octants, giving 4 spectra per antenna. Another set of data, called peak data, is obtained by taking the largest values recorded for the Ex antenna for each frequency and octant, and the values of By and Bz or Ez taken at the same time.

Signals for the low band are obtained from Ex and either By or Bz depending on a mode command. The sample rate of the signals is 256 times per spin of the spacecraft and a spectrum is produced every 16 telemetry frames, representing one spin. The same averaging/peak algorithm as the high band is used to on the low band.

3.4 Other URAP Instruments

In addition to the three instruments discussed above, URAP includes a resonance sounder and a Fast Envelope sampler, which provides short segments of wave data at time resolutions up to 1 msec. The Sounder spectra cover the frequency range from 1.25 to 48.5 kHz. This instrument was implemented in the URAP instrument package late in the development stage. Consequently, it is designed using elements of and telemetry reserved for the other instruments. Because it impacts the data acquired from the other URAP instruments, it is operated with a low duty cycle (e.g., in early 1995, the duty cycle is such as to acquire approximately, six spectra per day). As such, it's purpose is to provide a calibration source for other methods of determining density. These calibration results will be published in the scientific literature.

The Fast Envelope Sampler data provide 1024 samples of a wide-band, rectified wave amplitude with time resolution between 1.1 msec and 74 msec. Due to the low Ulysses telemetry rate, only one event can be telemetered every 49 formats (26 or 52

minutes depending on bit rate). Due to a variety of artifacts in the data, these events require special processing. The FES data are shown in the panels plotted at the bottom of the URAP Summary Plots (Postscript files). Other formats of the FES data will be archived at a later date.

4 World Wide Web Access to URAP Data

Some of the URAP data are being made available over the World Wide Web (WWW). By this means, the data are made convenient and quick to use by a much larger audience, including anyone with access to the Internet.

The URAP home page on the WWW provides more information for those interested. The home page makes available color dynamic spectra of the RAR data and information on the location of Ulysses during the mission. Educational material and a bibliography of papers describing Ulysses and URAP are also provided. The home page also gives links to other WWW sites of interest including NASA, Goddard Space Flight Center, the Jet Propulsion Laboratory and the European Space Agency, as well as other investigators using the Ulysses instruments and data.

The Universal Resource Locater for the URAP home page is

http://urap.gsfc.nasa.gov/www.urap_homepage.html

APPENDICES

A UDS data files

Eight files are provided that conform to the UDS conventions regarding the naming of files and the format of the data. The eight files are divided into 4 pairs of files with each pair consisting of a file containing data averaged over a 10 minute period and a file containing the maximum data value during the same 10 minute period. The 4 pairs of file contain data for the RAR, the PFR, WFA - magnetic field, and WFA - magnetic field.

A.1 Radio Astronomy Receiver

To reduce the size of the files produced, the UDS files contain 25 frequency channels for the RAR - the upper 12 frequencies of the high receiver, and 13 lower frequencies which are aggregates of the low frequency channels so that they appear in approximately the same logarithmic steps as the high frequency

receiver. Since the low frequency receiver steps are linear, there are different numbers of frequency channels that are combined to produce the UDS data.

Following is a table giving the approximate center frequency of each UDS channel and the RAR frequencies that were combined to produce it.

UDS channel	center frequency (kHz)	RAR frequency channels (kHz)	
1	1.25	1.25	Low receiver
2	2.00	2.00	
3	2.75	2.75	
4	3.50	3.50	
5	4.25	4.25	
6	5.75	5.00 - 6.5	
7	8.00	7.25 - 8.75	
8	11.0	9.50 - 12.5	
9	14.75	13.25 - 16.25	
10	19.25	17.00 - 21.50	
11	24.50	22.25 - 26.75	
12	31.25	27.50 - 35.00	
13	42.50	35.75 - 48.50	

14	52.0	52.0	High receiver
15	63.0	63.0	
16	81.0	81.0	
17	100.0	100.0	
18	120.0	120.0	
19	148.0	148.0	
20	196.0	196.0	
21	272.0	272.0	
22	387.0	387.0	
23	540.0	540.0	
24	740.0	740.0	
25	940.0	940.0	

Two files are produced for each day: they contain averages and peak values for 10 minute periods that start at 00:00:00 and end at 24:00:00. The time specified in the file is the beginning of each time period.

The data are computed as follows: For all RAR data that falls within the 10 minute period being considered the average and peak values are found for each of the 76 channels. Next the channels are combined to produce the 25 UDS channels: the average of the combined channels yields the UDS averages and the peak of the combined channels yields the UDS peak value.

The names of the files are (following the UDS convention):

```
UURARARAyyddd.ULY  :  Average data
UURARARPyyddd.ULY  :  Peak data
```

where:

yy = Last two digits of year.
ddd = Day of year (001..366).

The files are Ascii and contain one line for each time period (even if there are no valid data for a time period) so they contain 144 lines each. The format of the data is indicated by the following Fortran read statement which can be used to read the files:

```
       DIMENSION F(25)
       READ(1,100) IYEAR,IDOY,IHOUR,IMIN,ISEC,
      +MODE"_HI,MODE_LO,IBPS,F
100   FORMAT(I4,I4,3I3,3X,3I1,1P25E10.2)
```

where:

IYEAR: year
IDOY : day of year (Jan 1 = 001)
IHOUR: hour, UT
IMIN : minute, UT
ISEC : second, UT IYEAR .. ISEC is the beginning of the averaging period.
MODE_HI: mode of the high receiver:

1: Receiver in summed mode (X and Z antenna combined).
2: Receiver in separate mode(only X antenna).
3: Receiver switched mode during averaging period.
4: Receiver mode unknown.

MODE_LO: mode of the low receiver

1: Receiver in summed mode (X and Z antenna combined).
2: Receiver in separate mode (only X antenna).
3: Receiver switched mode during averaging period.
4: Receiver mode unknown.

IBPS: telemetry bits-per-second

1: 128 bps.
2: 256 bps.
3: 512 bps.
4: 1024 bps.
5: Bit rate changed during averaging period.
6: Bit rate unknown.

F: frequency data - channels 1..25 as defined above.

Invalid or missing data are assigned the value -99.0.

Units: microvolt/Hz**.5 measured at the receiver input terminals. To convert to electric field strength the given data must be divided by the effective length of the antenna. This is complicated by the fact that the effective length depends on the antenna impedance which is affected by the plasma conditions local to the Ulysses spacecraft. The impedance will also depend on the frequency. In general, the RAR frequency channels that are well above the local electron plasma frequency are not affected by the plasma conditions and the effective length of 23 meters can be used. When the RAR is in summed, rather than separate, mode the determination of field strengths is even more difficult.

Time resolution: 10 minutes.

A.2 Plasma Frequency Receiver

To reduce the size of the UDS files only 16 frequency channels are given which represent the combination of every 2 adjacent channels.

The UDS average data files are computed by averaging the Ex-average data values all data that falls in each 10 minute period for each of the 32 channels. Then adjacent channels are averaged together to yield the 16 channels present in the UDS files.

The UDS peak data files are computed by finding the the peak value of the Ex-peak data that falls in the 10 minute period. Then the peak of adjacent channels is found to yield the 16 channels present in the UDS files.

Because of the limited usefulness of fixed-frequency data when averaged, it has been ignored when creating the UDS files so these 1 hour intervals of fixed-frequency will be replaced by the "bad data" value of -99.

File names (following UDS convention):

```
UURAPFRAyyddd.ULY    -> Average data
UURAPFRPyyddd.ULY    -> Peak data
```

yy: Last two digits of year.
ddd: Day of year (001..366).

The files are Ascii and contain one line for each time period (even if there are no valid data for a time period) so they contain 144 lines each. The format of the data is indicated by the following Fortran read statement which can be used to read the files:

```
      DIMENSION F(16)
      READ(1,100) IYEAR,IDOY,IHOUR,IMIN,ISEC,MODE,IBPS,F
100   FORMAT(I4,I4,3I3,4X,2I1,1P16E10.2)
```

These variables are defined as follows:

IYEAR: year
IDOY: day of year
IHOUR: hour
IMIN: minute
ISEC: second
MODE: PFR scan mode:

1: Fast mode.
2: Slow mode.
3: Fixed frequency mode. This value should not occur as fixed frequency data is removed from the UDS data.
4: The mode switched from fast to slow or slow to fast during the averaging interval.
5: Unknown mode. This value occurs if there was no valid data during the averaging interval. This could be due to a data gap or bad data. Data acquired while the PFR is in fixed tune mode is ignored so this value for the MODE will also occur if the PFR was in fixed tune mode during the entire averaging interval.

IBPS: Telemetry bit rate:

1: 128 bps.
2: 256 bps.
3: 512 bps.
4: 1024 bps.
5: Bit rate changed during averaging period.
6: Bit rate unknown.

F: Contains the PFR data (either average or peak values, depending on the file) of the 16 frequency channels. The frequencies given below are the average of the two adjacent frequencies that are combined.

F(1): 0.61 kHz
F(2): 0.80 kHz
F(3): 1.04 kHz
F(4): 1.35 kHz
F(5): 1.77 kHz
F(6): 2.30 kHz
F(7): 3.01 kHz
F(8): 3.92 kHz
F(9): 5.11 kHz
F(10): 6.67 kHz
F(11): 8.70 kHz
F(12): 11.34 kHz

F(13): 14.79 kHz
F(14): 19.30 kHz
F(15): 25.16 kHz
F(16): 32.82 kHz

NOTES:

These data are electric field intensities detected by the Plasma Frequency Receiver (PFR) on the X antenna of the URAP instrument.

Units: microvolt/Hz**.5 measured at the receiver input terminals. To convert to electric field strength the given data must be divided by the effective length of the antenna. This is complicated by the fact that the effective length depends on the antenna impedance which is affected by the plasma conditions local to the Ulysses spacecraft. The impedance will also depend on the frequency. In general, the PFR frequencies can be affected by the plasma so a single number cannot be used for the effective antenna length.

Time resolution: 10 minutes

Fill value for bad or missing data is -99.0

A.3 Waveform Analyzer Electric Field

Four UDS files are produced per day for the WFA data. Two of the files contain average and peak data for the Ex signals and two files contain average and peak data for magnetic field data. The high band channels (upper 12 frequencies) always contain By. The low band channels (lower 10 frequencies) contain either By or Bz depending on the mode of the instrument. A flag specifying the mode is provided for each time interval.

The lowest two frequencies of the WFA are derived in a different manner so they have been left out of the UDS data. This leaves 10 frequencies from the low band and 12 frequencies from the high band. The frequencies are given below.

The peak data provided by the WFA high band frequently do not exceed the threshold background so the average values have been used in all cases.

The files of 10 minute averaged data were computed by, for all data falling within the 10 minute periods, finding the average values for each frequency.

Similiarly, the files of peak data were computed by, for all data falling within the 10 minute periods, finding the maximum value for each frequency.

The WFA data is affected by interference from other instruments.

In particular, interference from the PFR occurs and is dependent on the PFR scan mode. For this reason a flag indicating the PFR mode is provided in the WFA files.

WFA electric field data:

The names of the files are (following the UDS convention):

UURAWFEAyyddd.ULY -> Average data

UURAWFEPyyddd.ULY -> Peak data

yy: Last two digits of year.
ddd: Day of year (1..366).

The files are Ascii and contain one line for each time period (even if there are no valid data for a time period) so they contain 144 lines each. The format of the data is indicated by the following Fortran read statement (which can be used to read the files):

```
      DIMENSION F(22)
      READ(1,100) IYEAR,IDOY,IHOUR,IMIN,ISEC,IPFRMODE,IBPS,F
100   FORMAT(I4,I4,3I3,2X,2I1,1P22E10.2)
```

The variables are defined as follows:

IYEAR: year
IDOY: day of year
IHOUR: hour
IMIN: minute
ISEC: second
IPFRMODE: Indicates the scan mode of the PFR instrument.

1: Fast scan mode.
2: Slow scan mode.
3: Fixed-frequency mode.
4: The mode switched during the averaging interval.
5: The mode could not be determined.

IBPS: Telemetry bit rate:

1: 128 bps.
2: 256 bps.
3: 512 bps.
4: 1024 bps.
5: Bit rate changed during averaging period.
6: Bit rate unknown.

F: Contains the data for Ex (either average or peak values,

depending on the file) of the 22 frequency channels. The frequencies are:

F(1): 0.22 Hz
F(2): 0.33 Hz
F(3): 0.44 Hz
F(4): 0.66 Hz
F(5): 0.88 Hz

F(6): 1.33 Hz
F(7): 1.77 Hz
F(8): 2.66 Hz
F(9): 3.55 Hz
F(10): 5.33 Hz
F(11): 9.00 Hz
F(12): 14.00 Hz
F(13): 19.00 Hz
F(14): 28.00 Hz
F(15): 37.00 Hz
F(16): 56.00 Hz
F(17): 75.00 Hz
F(18): 112.00 Hz
F(19): 149.00 Hz
F(20): 224.00 Hz
F(21): 299.00 Hz
F(22): 448.00 Hz

These data are electric field intensities detected by the Waveform Analyzer (WFA) on the X antenna of the URAP instrument.

Units: microvolt/Hz**.5 measured at the receiver input terminals. To convert to electric field strength the given data must be divided by the effective length of the antenna. This is complicated by the fact that the effective length depends on the antenna impedance which is affected by the plasma conditions local to the Ulysses spacecraft. The impedance will also depend on the frequency. In general, the WFA frequencies can be affected by the plasma so a single number cannot be used for the effective antenna length.

Time resolution: 10 minutes

Fill value for bad or missing data is -99.0

A.4 Waveform Analyzer Magnetic Field

The names of the files are (following the UDS convention):

UURAWFBAyyddd.ULY -> Averaged data
UURAWFBPyyddd.ULY -> Peak data

yy: Last two digits of year.
ddd: Day of year (1..366).

The files are Ascii and contain one line for each time period (even if there are no valid data for a time period) so they

contain 144 lines each. The format of the data is indicated by the following Fortran read statement (which can be used to read the files):

```
       DIMENSION F(22)
       READ(1,100) IYEAR,IDOY,IHOUR,IMIN,ISEC,
      +IPFRMODE,IANTENNA,IBPS,F
100   FORMAT(I4,I4,3I3,2X,3I1,1P22E10.2)
```

The variables are defined as follows

IYEAR: year
IDOY: day of year
IHOUR: hour
IMIN: minute
ISEC: second
IANTENNA: Antenna used for low band (0.22 to 5.33 Hz). The high band (9.8 Hz and above) is always By.

1: By
2: Bz
3: Antenna switched during the averaging interval.
4: Antenna unknown.

IPFRMODE: Indicates the scan mode of the PFR instrument.

1: Fast scan mode.
2: Slow scan mode.
3: Fixed-frequency mode.
4: The mode switched during the averaging interval.
5: The mode could not be determined.

IBPS: Telemetry bit rate:

1: 128 bps.
2: 256 bps.
3: 512 bps.
4: 1024 bps.
5: Bit rate changed during averaging period.
6: Bit rate unknown.

F: Contains the data for By or Bz (either average or peak values, depending on the file) of the 22 frequency channels. The frequencies are:

F(1): 0.22 Hz
F(2): 0.33 Hz
F(3): 0.44 Hz
F(4): 0.66 Hz
F(5): 0.88 Hz

F(6): 1.33 Hz
F(7): 1.77 Hz
F(8): 2.66 Hz
F(9): 3.55 Hz
F(10): 5.33 Hz
F(11): 9.00 Hz
F(12): 14.00 Hz
F(13): 19.00 Hz
F(14): 28.00 Hz
F(15): 37.00 Hz
F(16): 56.00 Hz
F(17): 75.00 Hz
F(18): 112.00 Hz
F(19): 149.00 Hz
F(20): 224.00 Hz
F(21): 299.00 Hz
F(22): 448.00 Hz

These data are magnetic field intensities detected by the Waveform Analyzer (WFA) on the URAP instrument.

Units: 10**-15 Tesla/Hz**0.5

Time resolution: 10 minutes

Fill value for bad or missing data is -99.0

B URAP SUMMARY PLOT DESCRIPTION

Version 10 March 1995

B.1 Overview

A URAP Summary Plot is a plot of one day of Ulysses Unified Radio and Plasma (URAP) experiment data. The URAP experiment consists of five instruments: Radio Astronomy Receiver (RAR), Plasma Frequency Receiver (PFR), Wave Form Analyzer (WFA), Fast Envelope Sampler (FES), and Sounder (SND). The Summary Plot consists of six plot panels. Data are plotted in the form of dynamic spectra (3 dimensional plots of wave intensity versus frequency and time, with the degree of darkness proportional to the wave intensity. Frequency is plotted along the vertical axis, and time along the horizontal axis. A description of each plot panel is given in

Most of the data are stretched (assigned a grey shade) between minimum and maximum data values, the maximum being the minimum

plus dynamic range designated for a receiver. The specified dynamic ranges are shown at the right side of the plot, under the heading "Dyn. Range". A linear interpolation is done between minimum and maximum values to determine the degree of darkness of the plotted data point. Data at or below the minimum are plotted as white, and data at or above the maximum value are shown as black. The pixel-font uses a 4x4 dot pattern to represent 16 shades of gray.

B.2 Plot Description

B.2.1 Plot panel descriptions

The plot consists of six panels, the first four of which are plotted with time along the horizontal axis. For these plots the time increment is 128 seconds, which means that 675 time steps are represented along the horizontal axis, corresponding to 24 hours of data. For data with a higher time resolution than this, the maximum data value occurring during a 128 second interval is plotted. Frequency is plotted along the vertical axis. Frequency labels such as 100K refer to 100 KHz; otherwise the labels refer to Hz. Dynamic ranges shown at the right of the panels are in telemetry units, except for the WFA ranges, which are in logarithm of floating point DPU-FFT output. The panels are described in order from top to bottom.

Panel 1 This is a dynamic spectrum of RAR X antenna electric field data. The full set of 12 high receiver frequencies and 64 low receiver frequencies is plotted, with interpolation done for any missing frequencies (extrapolation is not done). The high receiver frequencies have a logarithmic spacing between approximately 50 KHz and 1 MHz. The low receiver frequencies are spaced linearly in frequency between 1.25 and 48.5 KHz.

Panel 2 This panel is a dynamic spectrum of electric field data from RAR, PFR and WFA instruments. The 12 frequencies of the RAR high receiver Z antenna data are plotted. A gap separates RAR and PFR data. The PFR data is the peak data from the X antenna. Thirty-two PFR frequencies are plotted, ranging from 0.5 to 35 KHz. When the PFR is in fixed tune mode, there are 32 times as many PFR samples at a single frequency. They are spread across the 32 frequencies, to permit a better representation of the single frequency data. Twenty-four WFA frequencies from the X electric field antenna are plotted at the bottom of the panel. The low

receiver frequencies range between about 0.1 to 5 Hz; the high receiver frequencies range from 9 to 448 Hz. The frequencies are approximately logarithmically spaced. The data plotted are average data from the WFA instrument.

Panel 3 WFA magnetic field data are plotted here. The high receiver data (upper 12 frequencies) are always from the Y search coil. The low receiver (lower 12 frequencies) will be either Y or Z search coil data, depending on which search coil was being sampled (indicated in panel 4). Frequencies and units are as for the WFA Ex data.

Panel 4 This panel indicates various instrument statuses. A dark line indicates an "on" condition, and a light line indicates "off". Six status flags are shown. These are: a) RAR SUM: The flag indicates whether the RAR is in summation (X+Z) mode. A dark line indicates summation is on. There are a pair of lines for this flag. The top line of the pair indicates RAR high receiver summation, and the second line indicates low RAR receiver summation. b) RAR POLAR: This flag indicates RAR polarization mode on or off. Again, the first of the two polarization lines is for the high receiver and the next is for the low receiver. c) PFR Fast: a dark line indicates that the PFR is in fast-scan mode; a light line indicates that the mode is slow-scan; no line indicates fixed-tune (single-frequency) mode. The fixed tune frequency is shown during the fixed tune interval. Note that the PFR causes a mode (and bit rate) dependent interference in the WFA data. d) Greater than 10 Hz Ez: This flag indicates that the WFA high receiver data is from the Ez antenna (dark) or, alternatively, from the WFA Bz antenna (light). Note that neither of these types of data is plotted on the Summary Plot. (Only Ex data is plotted for the high band EWFA; only By data is plotted for the high band BWFA.) e) Less than 10 Hz By: This indicates whether the magnetic data in the low receiver is from the By (dark) or Bz (light) antenna. This flag does correspond to the data plotted for the B lo receiver. f) 1024 bps: A dark line indicates 1024 bps data. A light line indicates 512 bps. A blank corresponds to a bit rate lower than 512 bps or a data gap.

Panels 5,6 The bottom two side-by-side panels (to the right of the plot label) show data for each observed FES event for high band and low band detectors. For each event, shown by a straight horizontal line, 1024 data points are taken. On the plot, however, only the maximum value of 4 contiguous

points is displayed. Up to 56 individual events may be plotted. The events are plotted from bottom to top of panel in order of their occurrence. The vertical scale is time of event in hours of the day. Each event shown represents the most intense FES event observed during 49 formats (a format is 32 sec at 1024 bps). These panels are in the form of dynamic spectra; therefore the degree of darkness is proportional to the intensity of data observed during event. The FES low and hi band plots show two vertical lines at the beginning of each plot. These indicate the instrument antenna and filter status. For the FES high band the Ex antenna is flagged by a black point, and the Ez antenna by a light point. The 6-60 kHz filter is shown by black, the 2-20 kHz filter is designated by a light point and all filters with an upper limit of 6 kHz or lower are designated by a blank. For the low receiver antenna, a black point indicates Ex, a light point, Ez, and no point, the B search coils. For the low band filter, a black point indicates 2-10 Khz, a light point .6-6 kHz, and no point indicates the upper frequency limit is lower than 2 kHz. When the FES receiver is attached to the B antenna, the band is always 0.01-1 kHz.

B.2.2 Overplotting plasma frequency, gyrofrequency

The option exists for plotting electron plasma frequency fpe, ion plasma frequency fpi and electron gyrofrequency fce as lines on the dynamic spectra. The fpe data is plotted on the PFR plot, fpi is plotted on the EWFA panel, and fce is shown on the BWFA panel. These data are obtained from Ulysses files of plasma (SWOOPS) and magnetometer (MAG) data, provided by the respective instrument teams.

B.2.3 Plot Labels

Various plot labels are printed in the lower left-hand corner of the Summary Plot. The first 3 lines give date of the plotted data, version number of the Summary Plot program, and date the plot was generated. The next 2 lines designate the RAR high and low receiver modes at the beginning and end of the plotted time interval. The modes are M (measure mode), L (linear sweep), and F (freeze mode). For measure mode, the list number is given after the "#" sign. For freeze mode, the frequency number follows the "#" sign. For the low receiver in measure mode, "F" designates full list, "E" indicates first half of list, and "O"

□

implies the second half of the list is used.

The next line indicates RAR background type and offset.
Designation for the RAR background determination is as follows:

Background type "0" indicates offset values (computed minus standard background values) and dynamic ranges may be specified for the RAR receiver. Background type "1" indicates that for each frequency a background is computed from the data for that day, and a histogram of data minus background for all frequencies is used to automatically set the offset and dynamic range for each RAR receiver. The offset and range depend on the percentage of white and black pixels chosen by the user. The offsets (either chosen or computed) are shown after the "/". The 3 offsets shown correspond to offsets for the RAR X high, X low, and Z high, respectively.

The next line shows the minimum and maximum data values in telemetry units for the RAR low X data for the day. In the next 3 lines, distances and angles are given as determined using various locations, namely, Ulysses (U), Sun (S), Jupiter (J), and Earth (E). The last 2 lines give the longitude and latitude of the spacecraft in either heliographic coordinates (_H) or ecliptic coordinates (_E), as determined from the SEDR database.

B.3 Computed Background and Dynamic Range Determination

Backgrounds may be computed from the data. This is done separately for each RAR receiver (RAR X high, RAR X low, RAR Z high) as well as for the non-RAR receivers (PFR, WFA high, WFA low, B WFA high and B WFA low). The goal is to achieve a full utilization of the gray scale. To accomplish this, a percentage of white and black pixels is specified, typically 4% white and 4% black. Histograms of the data values are computed for each panel. The background and range are defined by these histograms; i.e. they are calculated to provide the percentages of black and white pixels specified.

C USER'S GUIDE TO RAR 144 SECOND AVERAGED DATA FILES

This document describes the contents and format of the RAR 144 second averaged data files.

The time period of 144 seconds was used for the averaging period

□

because that is the basic cycling time of the instrument. The RAR continually cycles through a list of frequencies. There are 16 lists and the list currently in use is chosen by telecommand. The time period to complete the list is 144 seconds for the high band of the receiver (for telemetry bit rates of 1024 and 512 bps, the cycle time is 64 seconds for bit rates of 256 and 128

bps), after which the instrument begins with the list again. Therefore this period was chosen for the averaging period.

The format of the data is indicated by the following Fortran statement which can be used to read the data:

```
      DIMENSION F(0:75)
      READ(1,'(I4,2I2,1X,3I2,1X,5I2,12(/6E12.4),/4E12.4)')
     + IYEAR, IMONTH, IDAY, IHOUR, IMINUTE, ISECOND,
     + LO_POL_MODE, LO_SUM_MODE, HI_POL_MODE, HI_SUM_MODE,
     + IBPS, F
```

The variables are defined as follows:

The date and time of the beginning of the averaging period are given in IYEAR, IMONTH, IDAY, IHOUR, IMINUTE, ISECOND.

LO_POL_MODE and HI_POL_MODE are the polarization modes of the low and high receiver bands. Their values are defined as:

1: Polarization on.
2: Polarization off.
3: Polarization mode switched during the averaging interval.
4: Polarization mode was unknown (usually due to a data gap).

LO_SUM_MODE and HI_SUM_MODE are the polarization modes of the low and high receiver bands. Their values are defined as:

1: Summation on.
2: Summation off.
3: Summation mode switched during the averaging interval.
4: Summation mode was unknown (usually due to a data gap).

IBPS indicates the telemetry bit rate during the averaging interval. Its values are defined as:

1: 128 bps.
2: 256 bps.
3: 512 bps.
4: 1024 bps.
5: Bit rate changed during the averaging period.
6: Bit rate unknown - usually due to a data gap.

F is a vector containing the average signal for the 76 frequencies of the low and high bands. Elements 0 through 63 are from the low band receiver and correspond to frequencies of 1.25+0.75*N Khz where N is the element number (0..63). The frequency channels from 64 to 75 correspond to the following frequencies:

F(64): 52 KHz
F(65): 63 KHz
F(66): 71 KHz
F(67): 100 KHz
F(68): 120 KHz
F(69): 148 KHz
F(70): 196 KHz
F(71): 272 KHz
F(72): 387 KHz
F(73): 540 KHz
F(74): 740 KHz
F(75): 940 KHz

The units of the data are microvolt/Hz**.5 measured at the receiver input terminals. To convert to electric field strength the given data must be divided by the effective length of the antenna. This is complicated by the fact that the effective length depends on the antenna impedance which is affected by the plasma conditions local to the Ulysses spacecraft. The impedance will also depend on the frequency. In general, the RAR frequency channels that are well above the local electron plasma frequency are not affected by the plasma conditions and the effective length of 23 meters can be used. When the RAR is in summed, rather than separate, mode the determination of field strengths is even more difficult.

File: AAREADME.TXT Version: NSSDC 11/15/2001 JFC

URAP data from launch through June 1999 were previously available near-line through the NDADS/SPyCAT data system, but this system is no longer available. Later data are on-line in subdirectories of this anonymous ftp site, and the earlier data will be migrated here in the near future.

Please contact me if you have any questions about the locations of, or methods of access for, the URAP data at NSSDC.

Dr. John F. Cooper
Raytheon ITSS STX / SSDOO Project
NASA Space Physics Data Facility
Code 632, NASA Goddard Space Flight Center
Greenbelt, MD 20771

jfcooper@pop600.gsfc.nasa.gov
(301) 286-1193 (phone)
(301) 286-1771 (fax)

UYLSSES

Ulysses Urap UDS_10MIN PFRA

90-090B-06E

This dataset has been ingest to CD-ROM Write Once. The data was downloaded from /raid/ftp/spacecraft_data/Ulysses/radio/urap/uds_10min_ascii/pfra data is written in ASCII format. KD & KW numbers along with the time spans are as follows:

KD#	KW#	TIMESPAN
KD022281	KW000185	01/01/91 - 12/31/03

From: NCF::POST 6-MAR-2002 06:06:55.05
To: MAJAMES
POST
Subj: update

From: NCF::JCOOPER "John F. Cooper" 5-MAR-2002 18:38:13.39
To: POST BANDERSON
CC: JCOOPER
Subj: update to 6/2001, Ulysses URAP PFRA 10-minute UDS data set

Betty and Ralph,

The Ulysses URAP 10-min average E-field data set from the PFR sensor has been updated for Jan. - June 2001. The new data files have names of the form uurapfraYYDDD.asc for year 20YY and day DDD = 001 to 181. These ascii files are located at the following nssdcftp directory:

/raid/ftp/spacecraft_data/ulysses/radio/urap/uds_10min_ascii/pfra/2001/

Please download the new files to the off-line archived data set and update the # items for NMC.

Thanks.

John

****

taset ID: 90-90B-06E

Name (short): PFR 10m Spectra, Avg E-Field

Type Code: 1

Contact: Hess

Acq. Agent: JFC

NASA HQ Discipline Code: SPHE

NASA HQ Interest Code: 5C

Avail Code: A

First date of data: 1990-10-29

#Last date of data: 2001-06-30

#Change of available date: 2002-03-05

Long Name: URAP Plasma Frequency Receiver (PFR)
10-min Frequency Spectra, Average E-Field

qdat;
Date: 1998-01-05
Form: KV
Quantity: 1

Personnel info;

Dataset Contact:
Type: SO
Title: Dr.
First & middle initial: Robert J.
Last name: MacDowall
Current affl: NASA Goddard Space Flight Center, Code 695
City, State: Greenbelt, MD

Type: CO
Title: Mr.
First & middle initial: Roger A.
Last name: Hess
Current affl: NASA Goddard Space Flight Center, Code 690.2 / Hughes STX
City, State: Greenbelt, MD

Brief Description:

This data set is part of a collection of ASCII files of eight different types (NSSDC ID's 90-090B-06E to 06L) for frequency spectra of 10-minute average and peak intensity values of electric and/or magnetic intensity from three sensors in the URAP experiment, namely the Plasma Frequency Receiver (PFR), the Radio Astronomy Receiver (RAR), and the Wave Form Analyzer (WFA). The PFR, RAR, and WFA each provide averaged and peak value frequency spectra for electric field intensities in each 10-minute interval. The WFA also provides frequency spectra for magnetic fields. PFR and RAR frequency spectra are determined from measurements on the the X antenna of the URAP instrument in units of microvolt/Hz^0.5 for each frequency channel (0.61 - 32.82 kHz for the PFR and 1.25 - 940.0 kHz for the RAR). The WFA measures frequency spectra with a two-axis sensor aligned to the Y and Z spacecraft axes for frequency response in this data set at 0.22 - 448.0 Hz in units of microvolts/ Hz^0.5 for electric fields and 10^-15 Telsa/Hz^0.5 for magnetic fields. The data set includes a user guide document in ASCII text format. Details on the PFR, RAR, and WFA sensors are available in Stone, R.G., et al., "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

Data for this data type through June 30, 1999 were previously accessible near-line through the NDADS/SPyCAT service but are currently off-line pending migration to the NSSDC Anonymous FTP site. Later data are already accessible at this latter site, reached either via anonymous ftp login at nssdcftp.gsfc.nasa.gov at directory spacecraft_data/ulysses/radio/urap or via the following Internet URL address:

ftp://nssdcftp.gsfc.nasa.gov/spacecraft_data/ulysses/radio/urap/

Acknowledgements:

"the principal investigator, Dr. Robert J. MacDowall of the NASA Goddard Space Flight Center"

Archive Plan Flag: A
Archiving status flag: C
Archiving Planning/Status:
Archiving of these data files will continue through the Ulysses mission.
Archiving Location: NSSDC
Archiving Organization: NASA
Archive Type: P
Documentation Status Flag: D

State of Supporting Documentation:
The URAP users guide further describes the data types and data file formats.
Materials for Distribution:
Hard copies of the URAP users guide and the NDADS Ulysses holdings file.
Bibliographic References:

Sequence Number: 01
TRF ID: B40457-000A

Stone, R.G., J. L. Bougeret, J. Caldwell, P. Canu, Y. DeConchy, N. Cornilleau-Wehrlin, M. D. Desch, J. Fainberg, K. Goetz, M. L. Goldstein, C. C. Harvey, S. Hoang, R. Howard, M. L. Kaiser, P. J. Kellogg, B. Klein, R. Knoll, A. Lecacheux, D. Lengyel-Frey, R. J. MacDowall, R. Manning, C. A. Meetre, A. Meyer, N. Monge, S. Monson, G. Nicol, M. J. Reiner, J. L. Steinberg, E. Torres, C. deVilledary, F. Wouters, and P. Zarka, "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

UYLSSES

Ulysses Urap UDS_10MIN WFEA

90-090B-06I

This dataset has been ingest to CD-ROM Write Once. The data was downloaded from /raid/ftp/spacecraft_data/Ulysses/radio/urap/uds_10min_ascii/wfea data is written in ASCII format. KD & KW numbers along with the time spans are as follows:

KD#	KW#	TIMESPAN
KD022283	KW000187	01/01/91 - 12/30/03

From: NCF::POST 6-MAR-2002 06:09:15.60
To: MAJAMES
(POST
Subj: update time

From: NCF::JCOOPER "John F. Cooper" 5-MAR-2002 18:41:53.70
To: POST BANDERSON
CC: JCOOPER
Subj: update to 6/2001, Ulysses URAP WFEA 10-minute UDS data set

Betty and Ralph,

The Ulysses URAP 10-min average E-field data set from the WFA sensor has been updated for Jan.-June 2001. The new data files have names of the form uurawfeaYYDDD.asc for year 20YY and day DDD = 001 to 181. These ascii files are located at the following nssdcftp directory:

/raid/ftp/spacecraft_data/ulysses/radio/urap/uds_10min_ascii/wfea/2001/

Please download the new files to the off-line archived data set and update the # items for NMC.

Thanks.

John

****

taset ID: 90-90B-06I

Name (short): WFA 10m Spectra, Avg E-Field

Type Code: 1

Contact: Hess

Acq. Agent: JFC

NASA HQ Discipline Code: SPHE

NASA HQ Interest Code: 5C

Avail Code: A

First date of data: 1990-10-29

#Last date of data: 2001-06-30

#Change of available date: 2002-03-05

Long Name: URAP Wave Form Analyzer (WFA) 10-min
Frequency Spectra, Average E-Field

Dfqdat;
Date: 1998-01-05
Form: KV
Quantity: 1

Personnel info;

Dataset Contact:
Type: SO
Title: Dr.
First & middle initial: Robert J.
Last name: MacDowall
Current affl: NASA Goddard Space Flight Center, Code 695
City, State: Greenbelt, MD

Type: CO
Title: Mr.
First & middle initial: Roger A.
Last name: Hess
Current affl: NASA Goddard Space Flight Center, Code 690.2 / Hughes STX
City, State: Greenbelt, MD

Brief Description:

This data set is part of a collection of ASCII files of eight different types (NSSDC ID's 90-090B-06E to 06L) for frequency spectra of 10-minute average and peak intensity values of electric and/or magnetic intensity from three sensors in the URAP experiment, namely the Plasma Frequency Receiver (PFR), the Radio Astronomy Receiver (RAR), and the Wave Form Analyzer (WFA). The PFR, RAR, and WFA each provide averaged and peak value frequency spectra for electric field intensities in each 10-minute interval. The WFA also provides frequency spectra for magnetic fields. PFR and RAR frequency spectra are determined from measurements on the the X antenna of the URAP instrument in units of microvolt/Hz^0.5 for each frequency channel (0.61 - 32.82 kHz for the PFR and .25 - 940.0 kHz for the RAR). The WFA measures frequency spectra with a two-axis sensor aligned to the Y and Z spacecraft axes for frequency response in this data set at 0.22 - 448.0 Hz in units of microvolts/ Hz^0.5 for electric fields and 10^-15 Telsa/Hz^0.5 for magnetic fields. The data set includes a user guide document in ASCII text format. Details on the PFR, RAR, and WFA sensors are available in Stone, R.G., et al., "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

Data for this data type through June 30, 1999 were previously accessible near-line through the NDADS/SPyCAT service but are currently off-line pending migration to the NSSDC Anonymous FTP site. Later data are already accessible at this latter site, reached either via anonymous ftp login at nssdcftp.gsfc.nasa.gov at directory spacecraft_data/ulysses/radio/urap or via the following Internet URL address:

ftp://nssdcftp.gsfc.nasa.gov/spacecraft_data/ulysses/radio/urap/

Acknowledgements:

"the principal investigator, Dr. Robert J. MacDowall of the NASA Goddard Space Flight Center"

Archive Plan Flag: A
Archiving status flag: C
Archiving Planning/Status:
Arvchiving of these data files will continue through the Ulysses mission.
Archiving Location: NSSDC
Archiving Organization: NASA
Archive Type: P
Documentation Status Flag: D

State of Supporting Documentation:
The URAP users guide further describes the data types and data file formats.
Materials for Distribution:
Hard copies of the URAP users guide and the NDADS Ulysses holdings file.
Bibliographic References:

Sequence Number: 01
TRF ID: B40457-000A

Stone, R.G., J. L. Bougeret, J. Caldwell, P. Canu, Y. DeConchy, N. Cornilleau-Wehrlin, M. D. Desch, J. Fainberg, K. Goetz, M. L. Goldstein, C. C. Harvey, S. Hoang, R. Howard, M. L. Kaiser, P. J. Kellogg, B. Klein, R. Knoll, A. Lecacheux, D. Lengyel-Frey, R. J. MacDowall, R. Manning, C. A. Meetre, A. Meyer, N. Monge, S. Monson, G. Nicol, M. J. Reiner, J. L. Steinberg, E. Torres, C. deVilledary, F. Wouters, and P. Zarka, "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

UYLSSES

Ulysses Urap UDS_10MIN PFRP

90-090B-06F

This dataset has been ingest to CD-ROM Write Once. The data was downloaded from /raid/ftp/spacecraft_data/Ulysses/radio/urap/uds_10min_ascii/pfrp data is written in ASCII format. KD & KW numbers along with the time spans are as follows:

KD#	KW#	TIMESPAN
KD022282	KW000186	01/01/91 - 12/30/03

From: NCF::POST 6-MAR-2002 06:07:18.20
To: MAJAMES
CC: POST
Subj: update time

From: NCF::JCOOPER "John F. Cooper" 5-MAR-2002 18:38:45.15
To: POST BANDERSON
CC: JCOOPER
Subj: update to 6/2001, Ulysses URAP PFRP 10-minute UDS data set

Betty and Ralph,

The Ulysses URAP 10-min peak E-field data set from the PFR sensor has been updated for Jan.-June 2001. The new data files have names of the form uurapfrpYYDDD.asc for year 20YY and day DDD = 001 to 181. These ascii files are located at the following nssdcftp directory:

/raid/ftp/spacecraft_data/ulysses/radio/urap/uds_10min_ascii/pfrp/2001/

Please download the new files to the off-line archived data set and update the # items for NMC.

Thanks.

John

****

Dataset ID: 90-90B-06F

Name (short): PFR 10m Spectra, Peak E-Field

Type Code: 1

Contact: Hess

Acq. Agent: JFC

NASA HQ Discipline Code: SPHE

NASA HQ Interest Code: 5C

Avail Code: A

First date of data: 1990-10-29

#Last date of data: 2001-06-30

#Change of available date: 2002-03-05

Long Name: URAP Plasma Frequency Receiver (PFR)
10-min Frequency Spectra, Peak E-Field

Dfqdat;
Date: 1998-01-05
Form: KV
Quantity: 1

Personnel info;

Dataset Contact:
Type: SO
Title: Dr.
First & middle initial: Robert J.
Last name: MacDowall
Current affl: NASA Goddard Space Flight Center, Code 695
City, State: Greenbelt, MD

Type: CO
Title: Mr.
First & middle initial: Roger A.
Last name: Hess
Current affl: NASA Goddard Space Flight Center, Code 690.2 / Hughes STX
City, State: Greenbelt, MD

Brief Description:

This data set is part of a collection of ASCII files of eight different types (NSSDC ID's 90-090B-06E to 06L) for frequency spectra of 10-minute average and peak intensity values of electric and/or magnetic intensity from three sensors in the URAP experiment, namely the Plasma Frequency Receiver (PFR), the Radio Astronomy Receiver (RAR), and the Wave Form Analyzer (WFA). The PFR, RAR, and WFA each provide averaged and peak value frequency spectra for electric field intensities in each 10-minute interval. The WFA also provides frequency spectra for magnetic fields. PFR and RAR frequency spectra are determined from measurements on the the X antenna of the URAP instrument in units of microvolt/Hz^0.5 for each frequency channel (0.61 - 32.82 kHz for the PFR and 1.25 - 940.0 kHz for the RAR). The WFA measures frequency spectra with a two-axis sensor aligned to the Y and Z spacecraft axes for frequency response in this data set at 0.22 - 448.0 Hz in units of microvolts/ Hz^0.5 for electric fields and 10^-15 Telsa/Hz^0.5 for magnetic fields. The data set includes a user guide document in ASCII text format. Details on the PFR, RAR, and WFA sensors are available in Stone, R.G., et al., "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.

Data for this data type through June 30, 1999 were previously accessible near-line through the NDADS/SPyCAT service but are currently off-line pending migration to the NSSDC Anonymous FTP site. Later data are already accessible at this latter site, reached either via anonymous ftp login at nssdcftp.gsfc.nasa.gov at directory spacecraft_data/ulysses/radio/urap or via the following Internet URL address:

ftp://nssdcftp.gsfc.nasa.gov/spacecraft_data/ulysses/radio/urap/

Acknowledgements:

"the principal investigator, Dr. Robert J. MacDowall of the NASA Goddard Space Flight Center"

Archive Plan Flag: A
Archiving status flag: C
Archiving Planning/Status:
Archiving of these data files will continue through the Ulysses mission.
Archiving Location: NSSDC
Archiving Organization: NASA
Archive Type: P
Documentation Status Flag: D

State of Supporting Documentation:
The URAP users guide further describes the data types and data file formats.
Materials for Distribution:
Hard copies of the URAP users guide and the NDADS Ulysses holdings file.
Bibliographic References:

Sequence Number: 01
TRF ID: B40457-000A

Stone, R.G., J. L. Bougeret, J. Caldwell, P. Canu, Y. DeConchy, N. Cornilleau-Wehrlin, M. D. Desch, J. Fainberg, K. Goetz, M. L. Goldstein, C. C. Harvey, S. Hoang, R. Howard, M. L. Kaiser, P. J. Kellogg, B. Klein, R. Knoll, A. Lecacheux, D. Lengyel-Frey, R. J. MacDowall, R. Manning, C. A. Meetre, A. Meyer, N. Monge, S. Monson, G. Nicol, M. J. Reiner, J. L. Steinberg, E. Torres, C. deVilledary, F. Wouters, and P. Zarka, "The Unified Radio and Plasma Wave Investigation," Astron. and Astrophys. Supp. Ser., 92, 291-316, 1992.